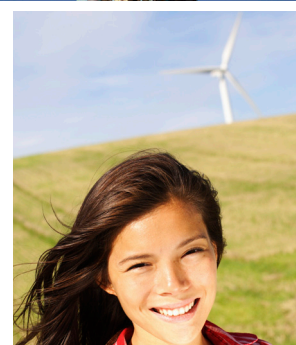


Wind Turbines and Health



Wind power has been gaining prominence as a viable sustainable alternative to other forms of energy production. Studies have found that there is increasing population demand for 'green' energy^{1,2}. In Australia, this has been encouraged by the introduction of the Renewable Energy (Electricity) Act in 2000 and the Renewable Energy Target Scheme in 2009.

As with any new technology, wind turbines are not without controversy. Those who oppose the development of wind farms contend that wind turbines can adversely impact the health of individuals living in close proximity.

Do wind turbines impact on health?

Concerns regarding the adverse health impacts of wind turbines focus on infrasound noise, electromagnetic interference, shadow flicker and blade glint produced by wind turbines.

While a range of effects such as annoyance, anxiety, hearing loss, and interference with sleep, speech and learning have been reported anecdotally, there is no published scientific evidence to support adverse effects of wind turbines on health.

Reported health concerns primarily relate to infrasound (sound that is generally inaudible to the human ear) generated by wind turbines. The World Health Organization states that 'There is no reliable evidence that sounds below the hearing threshold produce physiological or psychological effects'³. A recent expert panel review in North America found no evidence that audible or subaudible sounds emitted by wind turbines have any direct adverse physiological effect⁴. The principal human response to perceived infrasound is annoyance⁵.

A study of three UK wind farms also supports this conclusion, finding that sound associated with modern wind turbines is not a source which will result in noise levels which may be injurious to the health of a wind farm neighbour⁶. However, there is also the argument that if people are worried about their health they may become anxious, causing stress related illnesses which are genuine health effects arising from their worry, but not from the wind turbine itself. For this reason, NHMRC recommends that people who believe they are experiencing any health problems should consult their GP promptly.

The situation is further complicated by findings that people who benefit economically from wind turbines were less likely to report annoyance, despite exposure to similar sound levels as people who were not economically benefiting².

There is currently no published scientific evidence to positively link wind turbines with adverse health effects.

Inside

Do wind turbines impact on health?

How much sound do wind turbines produce?

Are there other features of wind turbines that may have effects on health?

How much sound do wind turbines produce?

Sound is composed of frequency expressed as hertz (Hz) and pressure level expressed as decibels (dB). Human sensitivity to sound is variable and people will exhibit variable levels of tolerance to different frequencies, including those below the normal range of human hearing⁷.

Noise can be defined as any undesirable or unwanted sound. The perception of the noise is influenced by the attitude of the hearer towards the sound source⁷. A recent study found that noise annoyance was strongly associated with a negative attitude to the visual impact of wind turbines on the landscape².

Table 1 compares the noise produced by a ten turbine wind farm compared to noise levels from some selected activities.

Table 1: Noise levels compared to a ten turbine wind farm	
Activity	Sound pressure level (dBA*)
Jet aircraft at 250m	105
Noise in a busy office	60
Car travelling at 64kph at 100m	55
Wind farm (10 turbines) at 350m	35–45
Quiet bedroom	35
Background noise in rural area at night	20–40

Based on these figures noise levels from wind turbines have been assessed as “negligible”, that is, they appear to be no different to that found in other everyday situations⁹. Further, a survey of all known published results of infrasound from wind turbines found that wind turbines of contemporary design, where rotor blades are in front of the tower, produce very low levels of infrasound¹⁰.

Are there other features of wind turbines that may have effects on health?

It has been suggested that phenomena such as shadow flicker and blade glint could have effects on health. Shadow flicker describes the flicking on and off of the wind turbine’s shadow as the blades rotate¹. The primary concern with shadow flicker is the potential to cause epileptic seizures. The evidence on shadow flicker does not support a health concern¹.

Blade glint happens when the surface of wind turbine blades reflects the sun’s light¹¹. All major wind turbine blade manufacturers coat their blades with a low reflectivity treatment which prevents reflective glint from the surface of the blade. The risk of blade glint from modern wind turbines is considered to be very low¹¹.

There has been some concern about electromagnetic radiation from wind turbines however the closeness of the electrical cables counters the electromagnetic field, as does shielding with metal armour¹².

Concerns regarding the adverse health impacts of wind turbines focus on infrasound, electromagnetic radiation, shadow flicker and blade glint produced by wind turbines, as discussed above. While there is currently no evidence linking these phenomena with adverse health effects, the evidence is limited.

Therefore it is recommended that relevant authorities take a precautionary approach and continue to monitor research outcomes. Complying with standards relating to wind turbine design, manufacture, and site evaluation will minimise any potential impacts of wind turbines on surrounding areas¹³.

* The “A” represents a weighting of measured sound to mimic that discernable by the human ear, which does not perceive sound at low and high frequencies to be as loud as mid range frequencies⁸.

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